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YOUNG & THOMPSON
209 Madison Street
Suite 500
ALEXANDRIA, VA 22314

EXAMINER	
ARCIERO, ADAM A	

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1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/519,548	GERRITSE ET AL.	
	Examiner	Art Unit	
	ADAM A. ARCIERO	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 9-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 9-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

BIOFUEL CELL

Examiner: Adam Arciero S.N. 10/519,548 Art Unit: 1795 December 31, 2008

DETAILED ACTION

1. The Applicant's amendment filed on October 16, 2008 was received. Claim 8 was cancelled. Claims 1-3, 10, 12, 15 and 18-22 are currently amended.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Drawings

3. The objection to the drawings are withdrawn in light of Applicant's amendments to the specification and drawings.

Claim Objections

4. The claim objection to claim 8 is withdrawn because claim 8 has been cancelled.

5. The claim objections for claims 19-20 are withdrawn because claims 19-20 have been amended.

Claim Rejections - 35 USC § 112

6. The claim rejections under 35 U.S.C. 112, second paragraph, on claims 2-3 are withdrawn, because the claims have been amended and Applicant's arguments regarding claim 2 are persuasive.

7. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to Claim 3, the term "substantially" in claim 3 is a relative term which renders the claims indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art ow3uld not be reasonably apprised of the scope of the invention. See MPEP 2173.05(b). For the interest of compact prosecution, claim 3 is examined as reciting "...are placed transverse to said electrodes."

Claim Rejections - 35 USC § 102

8. The claim rejections under 35 U.S.C. 102(b) as anticipated by HABERMANN et al. on claims 1, 4-6, 9-11, 13-14 and 16-17 are maintained. The rejections are repeated below for convenience.

As to Claims 1 and 4-6, HABERMANN et al. discloses a method for a modified fuel cell type for treating waste waters (pg. 132 and Fig. 5). An anode and cathode (pair of electrodes) present in the fuel cell are separated by a granulated slate solid electrolyte which is electrically

non-conductive and is a cation/anion-exchanger membrane (non ion-selective partition wall) (pg. 132 and Fig. 5). The cathode is aerated with an oxidant (air) from the inside (pg. 132 and Fig. 5). In the operating state, waste-water passes through the polyelectrolyte (porous) (pg. 132 and Fig. 5). Oxygen is reduced on the cathode, forming water, while at the anode carbon dioxide is produced along with electricity (pg. 130, and Fig. 1).

As to Claim 9, the electrodes are inherently three-dimensional electrodes because only three physical dimensions are perceived on Earth, and since the electrodes are physically present, they occupy three-dimensions only.

As to Claim 10, the anode in the biofuel cell of HABERMANN et al. is a graphite anode (pg. 132).

As to Claim 11, HABERMANN et al. discloses active carbon cathodes that are employed for the method for a modified fuel cell type for treating waste waters (pg. 128, Summary and pg. 129, Electrolytes and electrodes).

As to Claim 13, HABERMANN et al. teaches of biofuel cells with biologically active anodes and active carbon cathodes which are capable of being operated with humus constituents as fuel (humic acid) (pg. 128, Summary).

As to Claim 14, HABERMANN et al. teaches that the cell is used for the determination and quantification of biological activity such as the TOC (total organic carbon) and COD (chemically oxygen demand) content in the degradation of waste waters with the fuel cell (pg. 132, Table 4).

As to Claim 16, HABERMANN et al. discloses a method according to claim 1, wherein a series of inorganic ions were used as cations, for example trace elements such as iron (pg. 129, Materials and methods).

As to Claim 17, HABERMANN et al. discloses an embodiment wherein fuel is fed into the anode where it reacts under anaerobic conditions (lack of air) producing decomposition products (Figure 4). Said decomposition products are led through the separator to the cathode where it can further react under aerobic conditions (in the presence of air).

As to Claims 19-20, HABERMANN et al. discloses a modified fuel cell type for treating waste waters (pg. 132 and Fig. 5). An anode and cathode (pair of electrodes) present in the fuel cell are separated by a granulated slate solid electrolyte which is electrically non-conductive and is a cation/anion-exchanger membrane (non ion-selective partition wall) (pg. 132 and Fig. 5). Said partition wall forms two compartments, each compartment containing an electrode. The cathode is aerated with an oxidant (air) from the inside (pg. 132 and Fig. 5). In the operating state, waste-water passes through the polyelectrolyte (porous) (pg. 132 and Fig. 5). Oxygen is reduced on the cathode, forming water, while at the anode carbon dioxide is produced along with electricity (pg. 130, and Fig. 1). HABERMANN et al. further discloses wherein a series of inorganic ions were used as cations, for example trace elements such as iron (pg. 129, Materials and methods). The electrodes are inherently three-dimensional electrodes because only three physical dimensions are perceived on Earth, and since the electrodes are physically present, they occupy three-dimensions only. HABERMANN et al. discloses a graphite anode (pg. 132) and an active carbon cathode that are employed for the modified fuel cell type for treating waste waters (pg. 128, Summary and pg. 129, Electrolytes and electrodes).

Claim Rejections - 35 USC § 103

9. The claim rejections for 35 U.S.C. 103(a) as unpatentable over HABERMANN et al. and RICHTER et al. on claim 12 is maintained. The rejection is repeated below for convenience.

As to Claim 12, the disclosure of HABERMANN et al. as discussed above in claim 1 is incorporated herein. HABERMANN et al. does not expressly disclose the limitation of one or more of the electrodes provided with a precious metal catalyst.

However, RICHTER et al. teaches a biofuel cell which uses a thin and small electrode comprising a platinum alloy catalyst such as platinum-aluminum (col. 2, lines 22-33).

At the time of the invention, a person having ordinary skill in the art would have found it obvious to modify the biofuel cell of HABERMANN et al. with a platinum alloy catalyst so as to minimize the size and weight of the electrode while maximizing the activity of the catalyst along with the mechanical integrity, as taught by RICHTER et al. (col. 1, line 64-col. 2, line 40).

10. The claim rejections for 35 U.S.C. 103(a) as unpatentable over HABERMANN et al. on claim 15 is maintained. The rejection is repeated below for convenience.

As to Claim 15, HABERMANN et al. discloses in a working example of the operation of a biofuel cell for three days at 28 °C. HABERMANN et al. does not expressly disclose the method of claim 1 which is carried out at a temperature of 30-100° C, preferably 40-60° C.

However, at the time of the invention, it would have been obvious to one of ordinary skill in the art to have the biofuel cell of HABERMANN et al. operate at a temperature of 30-100° C, preferably 40-60° C, because according to MPEP 2144.05, "a *prima facie* case of obviousness

exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)." Furthermore, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "'Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.' *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (MPEP 2144.05)." Furthermore, "a particular parameter must first be recognized as a result-effective variable, i.e. a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (MPEP 21440.05)."

11. The claim rejections for 35 U.S.C. 103(a) as unpatentable over KIM et al. (EP 0827229 A2) and CHAO et al. on claims 1-7, 9-10 and 21 are maintained. The rejection is repeated below for convenience.

As to Claims 1, 4-7, 10 and 21, KIM et al. discloses the method for conversion of waste water (organic waste) (pg. 4, lines 51-56). The waste is introduced into the cell which comprises an anode compartment and cathode compartment separated by a sintered glass separator (pg. 5, lines 18-19 and Fig. 1). As shown in Figure 1, air (oxidizer) is fed into the portion of the cell around the cathode, and a potential difference is formed across said pair of electrodes (Figure 1) and carbon dioxide is inherently produced at the anode and electricity is produced. KIM et al.

also discloses a kit for processing organic waste comprising an anode and cathode (three dimensional electrodes) wherein the electrodes can be graphite felt electrodes (pg. 5, lines 14-17). KIM et al. does not expressly disclose that the sintered glass separator is a porous, electronically non-conductive, non ion-selective partition wall.

However, CHAO et al. teaches that separators may be used in electrochemical cells (i.e. fuel cells) to separate the anode from the cathode (col. 5, line 67 to col. 6, line 1). CHAO et al. further teaches that the separator is preferably permeable to the electroactive species and preferably completely chemically and physically stable in the cell environment (col. 6, lines 7-10). Suitable separators include sintered glass, inorganic ion-exchange membranes, and woven and non-woven fabrics made from fiberglass (col. 6, lines 10-14).

At the time of the invention, a person having ordinary skill in the art would have found it obvious to substitute a non-woven fiberglass separator (porous, electronically non-conductive, non ion-selective partition wall) for the sintered glass separator of KIM et al. because the two are known substitutes which provide for good separation of the anode and cathode in a fuel cell so as to reduce the rate of flow of electroactive species and electrochemical products, thus minimizing the reconversion of electrochemical products, as taught by CHAO et al. (col. 5, line 67 to col. 6, line 4). It would have been obvious that the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. CHAO et al. recognizes that sintered glass separators are equivalent to woven and non-woven fabrics such as fiberglass that can be used as a separator in an electrochemical cell between and anode and a cathode.

With respect to claim 2, KIM et al. as modified by CHAO et al. does not disclose two or more pairs of electrodes. However, it is known in the fuel cell art to have two or more pairs of electrodes stacked in series to increase the voltage output. It would have therefore been obvious to one of ordinary skill in the art to duplicate the fuel cell unit of KIM in order to increase voltage output. When the glass mat separator is used, there are inherently channels on each outer surface of the glass mat separator facing each of the respective electrodes.

With respect to Claim 3, KIM et al. as modified by CHAO et al. does not disclose multiple partitions placed substantially transverse to said electrodes. However, it is known in the fuel cell art that when having two or more pairs of electrodes stacked in series, that two or more partitions must be present in order to separate said two or more pairs of electrodes in order to prevent short circuiting. It would have therefore been obvious to one of ordinary skill in the art to duplicate the fuel cell unit of KIM et al. with multiple partitions present, in order to increase voltage output.

As to Claim 9, the electrodes are inherently three-dimensional electrodes because only three physical dimensions are perceived on Earth, and since the electrodes are physically present, they occupy three-dimensions only.

12. The claim rejections for 35 U.S.C. 103(a) as unpatentable over KIM et al. (WO 01/04061 A1) and CHAO et al. on claims 1-7, 9-10, 17 and 21 are maintained. The rejection is repeated below for convenience.

As to Claims 1, 4, 7 and 21, KIM et al. ('061) discloses the method for the conversion of waste water (organic waste) wherein the waste water is introduced as a fuel into a biofuel cell

consisting of a pair of electrodes (anode and cathode) and having an oxidizer introduced into the cathodic compartment and producing electricity and CO_2 off gas (Claim 4). KIM et al. ('061) discloses a cation exchange membrane used to separate the anode from the cathode and does not expressly disclose a porous, electronically non-conductive, non ion-selective partition wall used to separate the anode and cathode.

However, CHAO et al. teaches that separators may be used in electrochemical cells (i.e. fuel cells) to separate the anode from the cathode (col. 5, line 67 to col. 6, line 1). CHAO et al. further teaches that the separator is preferably permeable to the electroactive species and preferably completely chemically and physically stable in the cell environment (col. 6, lines 7-10). Suitable separators include sintered glass, inorganic ion-exchange membranes (cation exchange membrane of KIM et al. ('061)) and woven and non-woven fabrics made from fiberglass (col. 6, lines 10-14).

At the time of the invention, a person having ordinary skill in the art would have found it obvious to substitute a non-woven fiberglass separator for the cation exchange membrane of KIM et al. ('061) because the two are known substitutes which provide for good separation of the anode and cathode in a fuel cell so as to reduce the rate of flow of electroactive species and electrochemical products, thus minimizing the reconversion of electrochemical products, as taught by CHAO et al. (col. 5, line 67 to col. 6, line 4). It would have been obvious that the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. CHAO et al. recognizes that ion-exchange materials are equivalent to woven and non-woven fabrics such as fiberglass that can be used as a separator in an electrochemical cell between and anode and a cathode.

With respect to Claim 2, KIM et al. ('061) as modified by CHAO et al. does not disclose two or more pairs of electrodes. However, it is known in the fuel cell art to have two or more pairs of electrodes stacked in series to increase the voltage output. It would have therefore been obvious to one of ordinary skill in the art to duplicate the fuel cell unit of KIM et al. ('061) in order to increase voltage output. When the glass mat separator is used, there are inherently channels on each outer surface of the glass mat separator facing each of the respective electrodes.

With respect to Claim 3, KIM et al. as modified by CHAO et al. does not disclose multiple partitions placed substantially transverse to said electrodes. However, it is known in the fuel cell art that when having two or more pairs of electrodes stacked in series, that two or more partitions must be present in order to separate said two or more pairs of electrodes in order to prevent short circuiting. It would have therefore been obvious to one of ordinary skill in the art to duplicate the fuel cell unit of KIM et al. with multiple partitions present, in order to increase voltage output.

As to Claims 5-6, KIM et al. ('061) discloses the oxidizer of claim 1 as being air, containing oxygen (pg. 6, lines 5-9).

As to Claim 9, the electrodes are inherently three-dimensional electrodes because only three physical dimensions are perceived on Earth, and since the electrodes are physically present, they occupy three-dimensions only.

As to Claim 10, KIM et al. ('061) discloses that the cathode and anodes of the biofuel cell consist of a graphite felt (pg. 5, lines 29-31).

As to Claim 17, KIM et al. ('061) discloses that starch wastewater and an anaerobic sludge is used in the anodic compartment of the biofuel cell where electrochemically active

bacteria produce electric current while using the organic substances in wastewater as a fuel (pg. 6, lines 22-24). The cation produced from the anodic compartment is passed through the separator membrane which divides the anode from the cathode, and arrives at the cathode (pg. 6, lines 25-29). The cation is converted into water in the presence of oxygen, allowing electric current to be continuously produced (pg. 6 lines 30-33).

13. The claim rejections for 35 U.S.C. 103(a) as unpatentable over KIM et al. (WO 01/04061 A1), CHAO et al. and HABERMANN et al. on claims 11 and 14-16 are maintained. The rejection is repeated below for convenience.

As to Claim 11, the disclosure of KIM et al. ('061) in view of CHAO et al. as discussed in claim 1 above is incorporated herein. The combination of KIM et al. ('061) and CHAO et al. does not expressly disclose one or more electrodes comprising active carbon.

However, HABERMANN et al. discloses active carbon cathodes that are employed for the method for a modified fuel cell type for treating waste waters (pg. 128, Summary and pg. 129, Electrolytes and electrodes). At the time of the invention, a person having ordinary skill in the art would have found it obvious to activate the graphite felt cathode in the biofuel cell of KIM et al. ('061) and CHAO et al. so that the fuel cell is capable of continuous energy consumption using humus constituents or sugar waste as a fuel for over a period of five years without malfunction and maintenance, and purifying the waste water while producing energy, as suggested by HABERMANN et al. (Pg. 128, Summary).

As to Claim 14, HABERMANN et al. teaches that the cell is used for the determination and quantification of biological activity such as the TOC (total organic carbon) and COD

(chemically oxygen demand) content in the degradation of waste waters with the fuel cell (pg. 132, Table 4). At the time of the invention, a person having ordinary skill in the art would have found it obvious to employ the biofuel cell of KIM et al. ('061) and CHAO et al. as a sort of biosensor to determine and quantify biological activity within the cell such as COD and TOC content, as taught by HABERMANN et al. (pg. 132, Table 4).

As to Claim 15, HABERMANN et al. discloses in a working example of the operation of a biofuel cell for three days at 28 °C (pg. 132, col. 2). HABERMANN et al. does not disclose the method of claim 1, which is carried out at a temperature of 30-100° C, preferably 40-60° C.

However, at the time of the invention, it would have been obvious to one of ordinary skill in the art to have the biofuel cell of KIM as modified by CHAO and HABERMANN et al. operate at a temperature in the range of 40-60° C because, according to MPEP 2144.05, "a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)." Furthermore, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "'Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.' *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (MPEP 2144.05)." Furthermore, "a particular parameter must first be recognized as a result-effective variable, i.e. a variable which achieves a recognized result, before the determination of

the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (MPEP 21440.05)."

As to Claim 16, HABERMANN et al. discloses a method according to claim 1, wherein a series of inorganic ions were used as cations, for example trace elements such as iron (pg. 129, col. 2). At the time of the invention, a person having ordinary skill in the art would have been motivated to modify the fuel of KIM ('061) as modified by CHAO and HABERMANN et al. with trace elements of iron as cations so that the demands for energy and nutrients can be met, as taught by HABERMANN et al. (pg. 129, col. 2).

14. The claim rejections for 35 U.S.C. 103(a) as unpatentable over KIM et al. (WO 01/04061 A1), CHAO et al. and RICHTER et al. on claim 12 is maintained. The rejection is repeated below for convenience.

As to Claim 12, the disclosure of KIM et al. ('061) and CHAO et al. as discussed above in claim 1 is incorporated herein. The combination of KIM et al. ('061) and CHAO et al. does not expressly disclose the limitation of one or more of the electrodes provided with a precious metal catalyst.

However, RICHTER et al. teaches a biofuel cell which uses a thin and small electrode comprising a platinum alloy catalyst such as platinum-aluminum (col. 2, lines 22-33).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the biofuel cell of KIM et al. ('061) in view of CHAO et al. with a platinum alloy catalyst so as to minimize the size and weight of the electrode while maximizing the activity of

the catalyst along with the mechanical integrity, as taught by RICHTER et al. (col. 1, line 64-col. 2, line 40).

15. The claim rejections for 35 U.S.C. 103(a) as unpatentable over KIM et al. (WO 01/04061 A1), CHAO et al. and HERTL et al. on claim 13 is maintained. The rejection is repeated below for convenience.

As to Claim 13, the combination of KIM et al. ('061) and CHAO et al. does not expressly disclose the method according to claim 1, wherein one or more electrodes are provided with humic acid and/or anthraquinone-disulfonic acid.

However, HERTL et al. teaches a fuel cell which used suitable fuel solutions that comprise effective amounts of an electron-accepting quinone compound such as anthraquinone-2, 6-disulfonic acid. HERTL et al. further teaches that this compound is electrochemically reversibly and photoactive (col. 3, lines 37-48). At the time of the invention, a person having ordinary skill in the art would have found it obvious to use a fuel solution comprising effective amounts of anthraquinone-2, 6-disulfonic acid into the biofuel cell of KIM et al. ('061) and CHAO et al. so as to provide a provide a biofuel cell with a successful electron mediator, as taught by HERTL (col. 2, lines 46-56).

16. The claim rejections for 35 U.S.C. 103(a) as unpatentable over KIM et al. (WO 01/04061 A1), CHAO et al. and YAMAMOTO on claim 18 is maintained. The rejection is repeated below for convenience.

As to Claim 18, the disclosure of KIM et al. ('061) in view of CHAO et al. as discussed above in claims 1 and 21 is incorporated herein. The combination of KIM et al. ('061) and CHAO et al. does not expressly disclose the limitation of a means for discharging or storing electricity and provided with supply means for an oxidizer, preferably in the form of an air pump.

However, YAMAMOTO teaches a hybrid fuel cell system which comprises a storage battery (Abstract). An auxiliary controller for the fuel cell and an output current controller for controlling the output current drawn form the fuel cell is provided so that the storage battery can be charged for recovery within the shortest possible time (Abstract). YAMAMOTO also teaches a supply air blower **9** for providing air to the fuel cell **3** (col. 3, line 55-col. 4, line 5 and Figure 1).

At the time of the invention, a person having ordinary skill in the art would have found it obvious to modify the biofuel cell device of KIM et al. ('061) and CHAO et al. with an air blower so as to effectively provide the fuel cell with air, as taught by YAMAMOTO et al. (col. 3, line 55-col. 4, line 5 and Figure 1). Also, a person having ordinary skill in the art would have been motivated to incorporate a storage battery so that the biofuel cell system can be useful as a power supply in applications subject to sudden load fluctuations in power demand, as suggested by YAMAMOTO (Abstract).

17. The claim rejections for 35 U.S.C. 103(a) as unpatentable over KIM et al. (WO 01/04061 A1), CHAO et al. and YING et al. on claim 22 is maintained. The rejection is repeated below for convenience.

As to Claim 22, the disclose of KIM et al. ('061) in view of CHAO et al. as discussed above for claims 1 and 22 are incorporated herein. KIM in view of CHAO et al. does not expressly disclose the limitation of a kit for processing organic waste wherein the partition wall is of polyurethane foam.

However, YING et al. teaches a separator for a fuel cell which employs a protective coating layer comprising suitable polymers such as polyurethanes (col. 13, lines 52-59).

At the time of the invention, a person having ordinary skill in the art would have found it obvious to modify the separator of the biofuel cell of KIM et al. ('061) and CHAO et al. with a polyurethane protective coating so as to obtain an increase in toughness and flexibility without having a negative impact on the desired separator properties, as taught by YING et al. (col. 13, lines 60-65).

Response to Arguments

18. Applicant's arguments filed on October 16, 2008 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

a) HABERMANN et al. does not disclose the presence of a porous, electronically non-conductive, non-ion-selective partition wall, but instead an electrolyte (claim 1).

b) CHAO is not directed towards biofuel cells and therefore one would not find it obvious to substitute a non-woven fiberglass separator for the cation-exchange membrane of KIM et al. (claim 1).

c) it is not obvious to one of ordinary skill in the art to duplicate pairs of electrodes within a fuel cell (claim 2).

In response to Applicant's arguments, please consider the following comments.

a) HABERMANN et al. discloses a granulated solid slate separator which comprises an electrolyte consisting of a cation/anion exchanger mixture (pg. 132). Applicant defines an ion-selective membrane as being one which is either cation exchanging or anion exchanging (pg. 2, [0020] of the instant application). Therefore, said separator is porous, electrically non-conductive and non-ion-selective (cation/anion exchanger) (pg. 132).

b) CHAO is analogous in that the prior art is teaching the equivalence of a fiberglass separator and a cation-exchange membrane for use in fuel cells.

c) the courts have held that duplication of parts was obvious. In re St. Regis Paper Co. v. Beemis Co. Inc. 193 USPQ 8,11(1977); In re Harza 124 USPQ 378 (CCPA 1960).

Conclusion

19. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 8am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795